

MODEL COUNTY PLAN

Expedited Monumentation and Remonumentation Plan

for _____ County, Michigan

Prepared for the implementation of Act 345, P.A. 1990, as Amended,
and provide for a County Expedited Program pursuant to
Act 5, P.A. 1998

Approved: _____
(DATE)

_____, Chairperson, Board of County Commissioners

Prepared and Approved by:
The State Survey and Remonumentation Commission _____ 3/25/1992

Revised and Approved by:

Kathleen M. Wilbur, Director
Department of Consumer & Industry Services

(Date)

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This topic () is highly recommended, but is not required for approval by the Department of Consumer and Industry Services.

I INTRODUCTION – THE REASON FOR THIS PLAN

The adoption by the Board of County Commissioners of a “County Monumentation and Remonumentation Plan” is a requirement of Act 345, of the Public Acts of 1990. Act 5, P.A. 1998 amended Act 345 to allow for a county-expedited program where a county could prefund its program and recover expenditures over time by being reimbursed by future grants, if any. When the State Legislature was considering the adoption of Senate Bill 380 (which became Public Act 345), the following “supporting argument” was presented by nonpartisan Senate staff for use by the Senate in its deliberations:

Implementing the county monumentation program would mark the first time in 175 years that a concerted effort was made to do this critically needed job. Since the 1850s, there has been no statewide effort to validate corners, even though surveyors’ tools have advanced from a 33-foot chain and a compass to a technological arsenal that includes a device that gives automatic measurements of angles between corners, and instruments that bounce a signal off a satellite to determine the exact longitude and latitude of a given point. Orderly, consistent remonumentation with standardized markers would assist in the documentation and planning of roads and utilities, the (location) of public and private property, the settlement of ownership claims and disputes, and the provision of a central data base containing information on counties and townships throughout the State. Completion of the remonumentation system in a county would enable the county to implement a computerized mapping system that would include the precise location of roads, utilities, and property lines; the corners would serve as the foundation for such a map. Further, the remonumenting on a county-wide basis would be more economical than contracting out a few corners at a time, and individual surveys would be less expensive if surveyors could rely on monumented corners.

This county elects to participate in an expedited monumentation and remonumentation program and has adopted this county plan for that purpose. This plan must also be approved by the Department of Consumer and Industry Services in order to be eligible for state grants for monumentation and remonumentation. The Model County Plan with expedited provisions was prepared and adopted by the Department of Consumer and Industry Services pursuant to Section 8(1) of Public Act 345 of 1990, as amended, and may be adopted as is by a county or, if necessary, with changes appropriate for that county. The grants are made available from funds that the Counties must send to the state regularly, as has been done since January of 1991. Act 346 of the Public Acts of 1990 (Senate Bill 381) provides for the collection of funds by each county’s Register of Deeds.

II DEFINITIONS

The following words or phrases as used in this expedited plan are either contained in Act 345 of the Public Acts of 1990, as amended, or are necessary for its administration:

- A) **Act** – means Act 345 of the Public Acts of 1990, as amended, the State Survey and Remonumentation Act, as amended, being Sections 54.261 to 54.279 of the Michigan Compiled Laws.
- B) **Commission** – means the Director of the Department of Consumer and Industry Services.
- C) **Corner** – means a public land survey corner or a property controlling corner.
- D) **County Grant Administrator** – means a person appointed by the County Board of Commissioners as the individual responsible for completing and submitting the annual application for a Survey and Monumentation grant to the State of Michigan, and the administering of the approved annual grant. The County Grant Administrator's duties are those set forth herein.
- E) **County Representative** – means (1) the County Surveyor, whether elected or appointed, pursuant to Section 95 of Chapter 14 of the Revised Statutes of 1846, being Section 54.95 of the Michigan Compiled Laws; or, (2) the Professional Surveyor appointed by the County Board of Commissioners if the county does not have a County Surveyor. The County Representative shall perform any duties assigned by law and other duties described herein.
- F) **Department** – means the State Department of Consumer and Industry Services.
- G) **Expedited Remonumentation Program** - means a program adopted by the county board of commissioners and approved by the Michigan Department of Consumer and Industry Services; incorporated within the approved county plan; and, consistent with provisions of the State Survey and Remonumentation Act, and rules; the program must:
 - (a) be designed to complete, and result in the complete monumentation and remonumentation of the entire county within a period of 19 years or less from the date the original county plan was first approved by the State Survey and Remonumentation Commission, and

DEFINITIONS (continued)

- (b) contemplate and result in the expenditure of county funds (whether borrowed or not) from sources other than monies granted to the county by the State under the State Survey and Remonumentation Act, to expedite the completion of the monumentation and remonumentation of the entire county within a period of 19 years or less (from the date the original county plan was first approved by the State Survey and Remonumentation Commission).
- H) **Locate** – means to recover an existing corner which conforms to the minimum standards specified herein.
- I) **Lost Corner** – means a previously established corner whose position cannot be recovered beyond reasonable doubt, either from traces of the original General Land Office (GLO) marker or its accessories or from acceptable evidence or testimony that bears upon the original position, and, whose location can be restored only by reference to one or more interdependent corners.
- J) **Marker** – means the physical object which occupies the location of a public land survey corner, a property-controlling corner, or a horizontal or vertical control station.
- K) **Monument** – means to install a marker which meets or exceeds minimum standards as specified herein.
- L) **Monumentation Surveyor** – means the surveyor who is awarded a contract to (1) perform research for and monument or remonument markers; or, (2) establish horizontal and/or vertical control markers.
- M) **Obliterated Corner** – means a previously established corner which has no remaining traces of the marker or its accessories, but its position has been perpetuated or its position may be recovered beyond reasonable doubt by the acts and testimony of the interested landowners, competent surveyors, or other qualified local authorities or witnesses, or by some acceptable record evidence.
- N) **Open Meetings Act** – means Act 267 of the Public Acts of 1976, as amended, being Sections 15.261 to 15.275 of the Michigan Compiled Laws.
- O) **Peer Group** – means a minimum of three non-associated surveyors appointed by the County Representative. “Non-associated” means members are not from the same company or firm. One member of the Peer Group shall be the County Representative, who shall act as Chair of the Peer Group.

DEFINITIONS (continued)

- P) **Property-Controlling Corner** – means a Public Land Survey (PLS) corner or any property corner which does not lie on a property line of the property in question, but which controls the location of one or more of the property corners of the property in question.
- Q) **Public Land Survey Corner** – means any corner actually established and monumented in an original survey or resurvey used as a basis of legal description for issuing a patent for the land to a private person from the United States government.
- R) **Remonument** – means to install a marker where (1) the existing marker does not meet minimum standards as specified; or (2) the existing marker is in danger of becoming “lost” or “obliterated;” or, (3) the corner has been “lost” or “obliterated.”
- S) **Surveyor** – means a Professional Surveyor licensed under Article 20 of the Occupational Code, Act 299 of the Public Acts of 1980, being Sections 339.20001 to 339.2014 of the Michigan Compiled Laws.

III PLAN OBJECTIVES

- A) Provide for the location, monumentation and/or remonumentation of corners on an expedited timetable.
- B) Create a system for the research of the history of all corners and horizontal and vertical control markers.
- C) Create and maintain a repository for all records pertaining to Public Land Surveys.
- D) Provide for a "perpetual maintenance program" for all corners and horizontal and vertical control markers.
- E) Provide for the location of, and a data base for, horizontal and vertical control markers.
- F) Coordinate with adjoining counties for the monumentation of all county line corners.
- G) Annually determine monumentation requirements for which a grant application will be submitted for approval by the Department of Consumer and Industry Services.

IV GRANT ADMINISTRATION

For the purpose of implementation of this Act, the County Board of Commissioners must appoint a County Grant Administrator. The county shall also appoint a County Representative if the county has abolished the position of County Surveyor in accordance with law.*

The County Grant Administrator's duties include:

- A) Submitting annually a grant application and supporting documents to the Department of Consumer and Industry Services by December 31st of the year preceding the grant year. The annual grant application will clearly set forth the state grant amount and the expedited amount to be repaid from the fund.
- B) Selecting monumentation surveyors in compliance with Qualification-Based Selection (QBS) as set forth in House Concurrent Resolution 206 (June, 1987).
- C) Submitting proposed county/monumentation surveyor contracts to the Board of County Commissioners for its approval and its authorization for execution.
- D) Recommending payment to the monumentation surveyor as provided by the contract.
- E) Submitting other documents as may be required by the Department of Consumer and Industry Services.

*** NOTE: IF THE SURVEYOR ACTING AS THE COUNTY REPRESENTATIVE IS NOT A MONUMENTATION SURVEYOR, THAT PERSON MAY ALSO BE THE COUNTY GRANT ADMINISTRATOR.**

V PLAN EXECUTION

In addition to any duties assigned by law, the County Representative shall establish requirements and procedures to implement the following:

- A) Research the history of corners and horizontal and vertical control stations.
- B) Field verify whether corners are "existent," "lost," or "obliterated."
- C) Set a marker at all corners, following the Peer Group's ratification. The location of said corners shall be established in accordance with the procedures set forth in the "Manual of Instructions for the Survey of Public Lands of the United States" (1973) prepared by the Bureau of Land Management of the United States Department of Interior (Technical Bulletin 6, or subsequent editions).
- D) Recover all existing horizontal and vertical control stations.
- E) Perpetual monument maintenance of all corners.

THE COUNTY REPRESENTATIVE SHALL ALSO BE RESPONSIBLE FOR:

- A) Establishing, scheduling meetings of, and chairing a Peer Group which will meet and act as advisors for ratification of corner locations. These meetings shall be in compliance with the Open Meetings Act.
- B) Creating and maintaining a filing system for each corner, which contains all survey information compiled.
- C) Submitting documentation to the County Grant Administrator as required for the annual Application for Monumentation Grant which includes, but is not limited to, the following:
 - 1) For the current year projects, a description of the work area completed, the work area projected to be completed by December 31st and the work area remaining to be completed.
 - 2) A general work progress report for all previously awarded contracts.
 - 3) The proposed work program for the following year. The work program will indicate (a) the area where the Public Land Survey (PLS) corners and property-controlling corners are proposed to be monumented and/or remonumented within the next contract year; (b) the area where the PLS corners and property controlling corners are to be researched in the next contract year; (c) the area where corners will be checked and, if

PLAN EXECUTION (continued)

necessary, remonumented according to the perpetual monument maintenance plan; (d) the area where horizontal and vertical control stations are to be researched and located; and (e) the area where horizontal and vertical coordinates are to be established.

- D) Creating and maintaining a filing system for horizontal and vertical geodetic monumentation information obtained from the National Geodetic Survey (NGS), United States Geological Survey (USGS) and other sources.
- E) Coordinating the densification of horizontal and vertical geodetic monumentation with the State's Geodetic Advisor.

VI WORK PROGRAM

To meet the objectives of the Act, all work shall be performed in the following manner:

- A. Research: All corner locations shall be researched prior to monumentation. Copies of all research information shall be available to the public. The county may charge a reasonable fee for such copies.

No marker shall be considered a part of the plan until the research for its location has been performed and the location has been ratified by the Peer Group.

"Research on corners" means only those activities for the compilation of the historical records which pertain to a particular corner. All work performed beyond the compilation of a historical record is included in the work category "monumentation of corners."

- B. Monumentation: Annually locate and monument or remonument a specific number of corners so as to complete the program within the expedited time frame.

The corners proposed to be monumented shall be specified as part of the expedited annual grant application. An annual grant may include some unspecified corners in danger of becoming "lost" or "obliterated."

"Monumentation of corners" means all field and related activities which pertain to a corner including, but not limited to, field reconnaissance for evidence revealed in research data, searching, excavating, traversing, computing, monumenting, witnessing, etc. and peer group ratification of a corner.

For corners monumented under the Act, the monumentation surveyor shall furnish the County Representative two copies of a completed and recorded Land Corner Recordation Certificate (LCRC) as required by Act 74 of the Public Acts of 1970, as amended, being Sections 54.201 to 54.214 of the Michigan Compiled Laws. The County Representative shall forward one copy to the County Grant Administrator to be forwarded to the Department of Consumer and Industry Services with the work progress reports, as required by the Department.

Any surveyor may submit a corner location to the County Representative for Peer Group review. When filed with the County Representative, all information is considered filed with and available to the Commission. The county agrees to maintain these records and to provide copies of any records requested by the State at no charge.

VII PERPETUAL MONUMENT MAINTENANCE PLAN

When all corners have been monumented as specified under this Act, a perpetual monument maintenance program shall begin the year following the year of completion of monumentation or remonumentation. Each year thereafter, a minimum of 1/20th of the corners shall be checked and, if necessary, remonumented. The specific corners or specific region to be checked shall be a part of the annual grant application. Funds for maintenance of markers will be paid first from the annual grant amount with the remainder available to reimburse the county for prior eligible expenditures incurred while expediting the remonumentation program.

VIII GEODETIC DENSIFICATION AND MAINTENANCE PROGRAM

The County Representative shall research an entire county for existence of NGS/CGS (National Geodetic Survey/Coast and Geodetic Survey) and other important horizontal and vertical control stations. Thereafter, a thorough field search shall be made for each control station identified by the research. A report of the status of each station shall be prepared using the NOAA/NGS "DDPROC" (National Oceanic and Atmospheric Administration/National Geodetic Survey Descriptive Data Processing System) method. The report shall be filed with the County Representative, the Department of Consumer and Industry Services, and the NGS Geodetic Advisor for submission to NGS (National Geodetic Survey). The County Representative shall provide for the preservation and maintenance of all geodetic markers in the county.

When deemed timely by the County Representative, a monumentation surveyor shall be engaged to determine NAD 83 (North American Datum of 1983), three-dimensional coordinates in accordance with Act 9 of the Public Acts of 1964, as amended by Act 154 of the Public Acts of 1988, being Sections 54.231 to 54.239 of the Michigan Compiled Laws, on corners or other monumented points approved by the Department. All work for NGS control densification and inclusion into the National Geodetic Reference System (NGRS) shall meet or exceed the positional accuracy and marker requirements of Group C; Order 2; 20 PPM according to the FGCS standards entitled "Geometric Geodetic Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques" for GPS (Global Positioning Systems) or Second-Order Class I-1:50,000 minimum distance accuracy for all other measurement systems according to the FGCS manual entitled "Standards and Specifications for Geodetic Control Networks." The NGVD 1929 (National Geodetic Vertical Datum of 1929) datum will be used until such time as the new NAVD 1988 (North American Vertical Datum of 1988) vertical adjustment is completed.

Essentially, only the base network markers meeting the necessary requirements may become part of the NGRS and the corner markers will be positioned to a minimum of Third-Order Class I horizontal control network standards or Group C, Order 3-100 PPM for GPS according to the new FGCS standards and specifications.

GEODETTIC DENSIFICATION AND MAINTENANCE PROGRAM (continued)

The specific stations or specific region to be included in the annual work program shall be a part of the annual grant application.

IX AMENDING THE EXPEDITED PLAN

This plan may be amended subject to:

- A) Approval by the Board of County Commissioners; or,
- B) Approval by the State Department of Consumer and Industry Services.

X SEVERABILITY

If any section or provision of this expedited plan for any reason conflicts with present or future Legislative Acts or Administrative Rules, that section shall be invalid, but such invalidation shall not affect the remaining provisions of this plan.

XI ANNUAL FUNDING AVAILABILITY

Work programs specified in Sections VI, VII and VIII shall be adjusted depending upon the actual annual grant and other funds available.

The State shall be liable to the county for none of the costs expended and/or borrowed and subject to reimbursement under this agreement, except to the extent to which monies are appropriated by the Legislature and made available to the State of Michigan, Department of Consumer and Industry Services. The monies for survey and remonumentation are allocated annually under the provisions of the Act to the county consistent with the Act, rules, and annual grant formula.

APPENDIX A – ITEMS ELIGIBLE FOR EXPEDITED GRANT FUNDS

Items eligible for grant funds include, but are not limited to, the following:

1. Corner research expenses. Expenditures incurred for “research on corners” means only those expenditures incurred for the compilation of the historical records which pertain to a particular corner. Any work performed beyond the compilation of a historical record is considered “monumentation of corners.”
2. Corner monumentation expenses. Expenditures incurred for “monumentation of corners” means all field activities which pertain to a corner including, but not limited to, field reconnaissance for evidence revealed in research data, searching, excavating, traversing, computing, monumenting, witnessing, etc. and peer group ratification of a corner.
3. Time spent in developing corner location documentation, including time spent to research existing records, summarize the evidence found, prepare drawings when necessary, and prepare a final report. Information to be shown on the above-noted drawing may include traverse information and useful physical features (e.g., lines of occupation, roadways, fences, etc.).
4. Time spent in presenting corner locations to the Peer Group for ratification.
5. Grant monies used to pay for installation of a marker for survey work which is a part of another public or private contract or work assignment. A contract must be executed prior to the services being performed. The county may furnish the marker to be used or include the cost for it in the contract for monumentation. There are no other eligible costs for this type of corner monumentation.
6. Such other items as may be specified in the annual grant application and approved by the Department of Consumer and Industry Services.

APPENDIX B – PROCEDURE FOR RATIFICATION OF A CORNER POSITION

When a monumentation surveyor desires the ratification of a corner position, he/she shall make a written request for same to the County Representative, accompanied by the corner position documentation. Not later than 28 calendar days after said request, the County Representative shall call and chair a meeting, noticed in compliance with the Open Meetings Act, of a Peer Group to review the corner position documentation furnished.

At least ten days prior to the meeting, the County Representative shall give notice of the meeting to the Peer Group, each monumentation surveyor whose corner position documentation will be reviewed, and any surveyor who has set a corner different from the position being considered. All corner position documentation will be reviewed by the Peer Group. Minutes shall be taken which shall become the official record when approved by the Peer Group.

A monumentation surveyor may not consider or vote on his/her own corner(s) for ratification as a member of a Peer Group.

When a surveyor brings a corner to the Peer Group for ratification as a result of work performed to fulfill a public or private contract or work assignment for other than a remonumentation contract, that corner may be considered for ratification by the Peer Group. Upon approval by the Peer Group of such a corner for monumentation, the corner is considered a part of the program. The county Grant Administrator may provide the marker and use grant monies to pay the cost of installation of a marker if a county requires a special marker other than what is necessary to meet the minimum requirements of P.A. 74 of 1970.

After the Peer Group's ratification, the monumentation surveyor shall install the appropriate corner marker and cap and shall file a Land Corner Recordation Certificate as required by Act 74 of the Public Acts of 1970, as amended, being Sections 54.201 to 54.214 of the Michigan Compiled Laws. Two copies of said certificate shall be furnished to the County Representative.

APPENDIX C – MINIMUM STANDARDS FOR MONUMENTATION

The permanent marker set at the location of the corner shall be set in conformance with Act 74 of the Public Acts of 1970, as amended, being Sections 54.201 to 54.214 of the Michigan Compiled Laws.

The county shall adopt standardized markers and/or caps to be utilized when remonumentation is necessary.

APPENDIX D – MINIMUM STANDARDS FOR CORNER WITNESSING

All corners shall be witnessed in accordance with Act 74 of the Public Acts of 1970, as amended, and the published rules promulgated by the State Board of Land Surveyors under Act 299 of the Public Acts of 1980, as amended, being Sections 339.2001 to 339.2014 of the Michigan Compiled Laws.

APPENDIX E – RESEARCH

I. RESEARCH SOURCES AND ANALYSIS

By thoroughly examining and using the following list of sources for survey information, the prudent surveyor can be confident that the corner has been properly located:

- A. General Land Office (GLO) Survey: including original, dependent, independent, or omitted lands (notes, plats, and special instructions).

If these records are not available in the county offices, they may be obtained from the Michigan Department of Natural Resources, the National or State Archives, or the Eastern Regional Office of the Bureau of Land Management.

<u>Sources</u>	<u>Type of Information Usually Available</u>
B. COUNTY RECORDS:	
County Surveyor	Land Corner Recordation Certificates, public and private land surveys and notes
County Register of Deeds	Land Corner Recordation Certificates, land surveys, subdivision plats, condominium subdivisions and other records
County Road Commission or Department of Public Works	Highway location surveys, GLO corner ties, highway easements, township road orders and other records
County Drain Commissioner or Department of Public Works	County and township drain records, unrecorded maps, and other records
Clerk of Court	Court records
Abstract Office/Title Company	Abstract records, survey maps, tract maps

Sources	Type of Information Usually Available
Local Assessor	Conveyances, survey maps, tax maps and descriptions
Adjoining County Offices or Local Departments of Public Works	County line records, county line roads
C. MUNICIPAL RECORDS:	Board meeting minutes, cemetery records, township road and drain descriptions and maps, engineer, clerk, zoning administrator, utility and public works departments
D. OTHER AGENCIES:	
State	Department of Management and Budget (Bureau of Facilities), Department of Transportation, Department of Natural Resources, universities and historical collections, State Archives, State Library
Federal	Bureau of Land Management, Fish and Wildlife Service, Soil Conservation Service, U.S. Corps of Engineers, Civilian Conservation Corps, Coast Guard, National Parks Service, U.S. Forest Service, federal Aviation Administration, Federal Communications Commission, National Geodetic Survey, U.S. Geological Survey, Bureau of Indian Affairs, International Great Lakes Survey, Defense Mapping Agency
Adjoining States	Bordering state survey records (Indiana, Ohio, Wisconsin)

	<u>Sources</u>	<u>Type of Information Usually Available</u>
E.	OTHER SOURCES:	Private surveyors' and engineers' records, utility companies, forest product companies, mining companies, land agencies, railroad companies, abstractors, lending institutions, historical societies, oil and gas companies, American Land Title Association surveys
F.	OTHER MAPS AND PLATS:	Plat books of ownership (Index to County Atlases and Plats)
G.	AERIAL PHOTOS:	U.S. Soil Conservation Service, U.S. Agriculture Stabilization and Conservation Service, Department of Natural Resources, Department of Transportation, aerial mapping companies, and/or other agencies previously listed
H.	For Property Owner and Resident Interviews:	
	1.	Develop an interview form. The form should include space for the date, interviewer's name, and the name, statement, and signature of the person interviewed.
	2.	The interviewer should determine the credibility of the person interviewed and make a statement on the interview form.
	3.	The interviewer should attempt to obtain an affidavit when important parole evidence is used to determine the position of a corner.

ANALYSIS:

- A. Develop a checklist to ensure that all possible sources of information have been investigated.
- B. Review, when necessary, all maps, plats, and aerial photos with the Public Land Survey (PLS) notes to correlate physical calls such as streams, lakes, swamps, etc., with distances on the maps, plats and photos.
- C. Review, when necessary, subsequent surveys to correlate with the PLS and other later surveys.

II RECONNAISSANCE (FIELD)

- A. All record data related to established monuments, accessories, and calls to natural features should be reviewed to locate and define the area of search. Thereafter, a reconnaissance of the area, using the record-research data or PLS methods, is necessary to narrow the area of search and explore the area for evidence. Then, make a survey to locate existing monuments, occupation lines, possible corner locations, and natural feature calls from PLS field notes.
- B. A licensed professional surveyor experienced in land corner search, should make the field search or valuable evidence may be overlooked or destroyed.
- C. The field search should be made at a time of year when conditions are most suitable for uncovering evidence. This may depend on the terrain, vegetation, or seasonal ground cover.
- D. The record evidence of the monument to be located will suggest the type of search equipment to be used during the field search. The following list should be considered when preparing for the search:
 - 1. Metal locator – for recovery of metallic monuments.
 - 2. Hand tools (picks, shovel, etc.) – where monumentation is expected within a small area or near the surface.
 - 3. Mechanical equipment (backhoe or jackhammer) – for excavation in large, deep, or difficult search areas.

The surveyor's judgement will control the depth and extent of the excavation. For reference purposes (for future surveys), provide an excavation report describing the extent and the location of the excavation. This may eliminate duplicate excavation efforts.

- E. In areas where the only information available is the original General Land Office (GLO) survey data or where it is difficult to narrow down a corner search area, it may be advantageous to perform a corner search after a random traverse line has been surveyed along the section lines between known corners. The original line calls and corner locations can be calculated and field located from the random traverse, thus narrowing down the search area and maximizing the effort spent on the actual field search for original survey evidence and/or subsequent survey corner evidence.

CORNER MONUMENTATION

FIELD MONUMENTATION

A. Type of Marker

A durable and easily identifiable marker locateable with a magnetic locator should be placed at the position of each remonumented corner, if possible. Each county will standardize the markers placed within its boundaries. Each marker will be stamped or engraved to identify it, have a centering mark to define the exact location of the corner, and be stamped with the license number of the surveyor responsible for its placement.

B. Inplace Markers

An existing in-place, non-ferrous marker shall be replaced with a standard county marker.

SETTING OF MARKER

The marker should be placed carefully to minimize any future movement of the marker. Reference markers should be placed where corner positions are in unstable or inaccessible locations. It is always necessary to consider what future uses may be made of the marker location.

NUMBER OF WITNESSES

Each marker should have a minimum of four (4) witnesses to substantial objects.

LAND CORNER RECORDATION CERTIFICATE

A Land Corner Recordation Certificate shall be prepared and filed for each corner monumented or remonumented. This certificate shall be a complete document relating to the location, monumentation, perpetuation and history of a corner in accordance with Act 74, P.A. 1970, as amended.

HORIZONTAL CONTROL

The ultimate goal of the remonumentation program is the remonumentation of every corner in the State of Michigan, which may include the determination of NAD 83 (North American Datum of 1983) three-dimensional coordinates on these remonumented corners. The task of remonumentation will frequently involve horizontal traverse work between existing corners to enable the restoration of lost and/or obliterated corners. In order to maximize the remonumentation efforts, this traverse should be performed to the minimum accuracy standard allowable to meet the requirements of Act 9, Public Acts of 1964, as amended, by Act 154, Public Acts of 1988 being Sections 54.231 to 54.239 of the Michigan Compiled Laws, i.e., FGCS, Third-order Class I for Horizontal Control.

It should be stressed that the recommended survey control system does not propose to promote the State Plane Coordinate system at the expense of adequate monumentation perpetuation and recordation of corners. Instead, the system seeks to remonument the corners and to erect new accessories to these corners in accordance with sound land surveying procedures while at the same time applying all of the advantages of the State Plane Coordinate system. In counties where extensive traverse work will be required, it will be advantageous to be on the State Plane Coordinate System right from the beginning of the remonumentation project.

There are several publications that can be obtained from the National Geodetic Survey that can assist in understanding State Plane Coordinates and implementing these types of survey traverses:

1. **Understanding State Plane Coordinate Systems** by Joseph F. Dracup
2. **Fundamentals of the State Plane Coordinate Systems** by Joseph F. Dracup
3. **FGCC, Standards and Specifications for Geodetic Control Networks**
4. **FGCC, Geometric Geodetic Accuracy Standards and Specifications for Using GPS Relative Positioning Techniques**

These publications, along with the horizontal and vertical geodetic control data for the county, can be obtained from:

NGS Information Center
N/CG 174, Room 26
Rockwall Building
Rockville, Maryland 20852
(301) 443-8631

ADDRESSES FOR RESEARCH SOURCES

ACSM American Congress on Surveying and Mapping 5410 Grosvenor Lane Bethesda, Maryland 20814	INTERSTATE COMMERCE COMMISSION 12 th Street & Constitution Avenue, N.W. Washington, D.C. 20423
CADASTRAL SURVEY Eastern States Office 350 S. Pickett Street Alexandria, Virginia 22304	MICHIGAN DEPARTMENT OF MANAGEMENT AND BUDGET Bureau of Facilities Stevens T. Mason Building 530 W. Allegan P.O. Box 30026 Lansing, Michigan 48909
CIVILIAN CONSERVATION CORPS [This agency became the Works Progress Administration in 1935, then the Works Projects Administration in 1939, then Consolidated Federal Works Administration in 1942. It was abolished in 1949 and its services were transferred to the General Services Administration.] 6100 S. Blackstone Avenue Chicago, IL 60637-2912	MICHIGAN DEPARTMENT OF NATURAL RESOURCES Geological Survey Division/Lands Division 735 E. Hazel P.O. Box 30028 Lansing, Michigan 48909
DEFENSE MAPPING AGENCY 8613 Lee Highway Fairfax, Virginia 22031-2137	MICHIGAN DEPARTMENT OF STATE Bureau of History Archives Section 717 W. Allegan Lansing, Michigan 48918-1800
FEDERAL COMMUNICATIONS COMMISSION 1919 "M" Street, N.W. Washington, D.C. 20554	MICHIGAN DEPARTMENT OF STATE Michigan State Library 717 W. Allegan Lansing, Michigan 48918-1800

INTERNATIONAL GREAT LAKES SURVEY [This organization no longer exists. Its work was split in half between NOAA and the Corps of Engineers. The data on buoys and level gauges went to NOS, the benchmarks for vertical control on the Great Lakes went to the Geodetic Survey, the analytical work went to the Corps.]	MICHIGAN DEPARTMENT OF TRANSPORTATION Transportation Building 425 W. Ottawa P.O. Box 30050 Lansing, Michigan 48909
U.S. DEPARTMENT OF INTERIOR National Parks Service 1849 "C" Street, N.W., Room 3104 Washington, D.C. 20240	U.S. DEPARTMENT OF COMMERCE 14 th Street and Constitution Avenue, N.W. Washington, D.C. 20230
NATIONAL ARCHIVES AND RECORDS SERVICE General Services Administration Washington, D.C. 20408	U.S. DEPARTMENT OF INTERIOR Bureau of Land Management 1849 "C" Street, N.W. Washington, D.C. 20240
NATIONAL OCEAN SERVICE Universal Building South 1825 Connecticut Avenue, N.W. Washington, D.C. 20235	U.S. DEPARTMENT OF INTERIOR U.S. Fish and Wildlife Service 1405 S. Harrison Road East Lansing, Michigan 48823
OFFICE OF COAST AND GEODETIC SURVEY Washington Science Center Building 1 6001 Executive Boulevard Rockville, Maryland 20852	U.S. DEPARTMENT OF INTERIOR U.S. Geological Survey 6520 Mercantile Way Lansing, Michigan 48933
U.S. AGRICULTURE STABILIZATION AND CONSERVATION SERVICE 1405 S. Harrison Road East Lansing, Michigan 48823	U.S. DEPARTMENT OF TRANSPORTATION Federal Aviation Administration Federal Highway Administration 211 Federal Building Lansing, Michigan 48933
U.S. ARMY CORPS OF ENGINEERS North Central Division P.O. Box 1027 Detroit, Michigan 48231-1027	U.S. GOVERNMENT PRINTING OFFICE Superintendent of Documents Division of Public Documents Washington, D.C. 20402
U.S. ARMY CORPS OF ENGINEERS 20 Massachusetts Avenue, N.W. Casimir Pulaski Building Washington, D.C. 20314	U.S. DEPARTMENT OF AGRICULTURE U.S. Forest Service 1407 S. Harrison Road East Lansing, Michigan 48823

APPENDIX F – SURVEY HISTORY

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